



**2021 Bunker and Drainage Renovations  
at Brown County Golf Course**

**TECHNICAL SPECIFICATIONS**

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**Prepared for:**

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1/5/2021



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## **CONTRACTOR QUALIFICATIONS FORM**

In order to ensure bids are received only from qualified and experienced Contractors currently active in golf course construction, all Bidders must submit a qualification statement to the Owner on the form provided below. This form (and any supplemental documents) must be attached to the proposal form. Failure to do so may result in disqualification of the bidder:

### **Contractor's Information**

Business Name & Address: \_\_\_\_\_

Contact Person Name & Title: \_\_\_\_\_

Contact Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Contractor has been in business under present business name for \_\_\_\_ years, from \_\_\_\_ to \_\_\_\_

### **Contractor Qualification Questions**

Number of years in golf course construction and/or renovation business \_\_\_\_\_

Member of the Golf Course Builders Association of America? Yes / No Member since (year) \_\_\_\_\_

### **Contractor Experience and References**

On a separate sheet, provide the following work samples and related references:

- A. Company profile and list of the five (5) most recently completed golf course construction projects of similar scope in the last five (5) years, including Owner's name and phone number, brief description of work performed by Contractor and relevant sub-contractors.
- B. Name/resume of General Superintendent that would be assigned to this project and this individual's three (3) most recently completed golf course construction projects as Superintendent.
- C. Name/resume of the Lead Shaper that would be assigned to this project and this individual's three most recently completed golf course construction projects as Lead Shaper.
- D. List all construction projects your organization has in progress, giving the name of the project, brief description, address, Owner and telephone number, architect and telephone number, contract amount, percent complete, and scheduled completion date.

### **Subcontractors**

On a separate sheet, provide listing of all anticipated sub-contractor work to be performed, on the project (if any) including relevant company info, similar project experience (**per above requirements**), references and resumes.



## **GOLF COURSE TECHNICAL SPECIFICATIONS**

Whenever these words are used in the following Golf Course Technical Specifications, they shall have the meaning here given:

**Owner:** Shall mean the Brown County Golf Course and its legal representatives.

**Golf Course Architect:** Lohmann Quitno Golf Course Architects, Inc. and its legal representatives

**Contractor or Bidder:** Shall be considered one and the same, and shall mean the party entering into this contract for the performance of the work required by it, and the legal representative of said party of the agent appointed to act for said party in the performance of the work.

### **SPECIAL PROVISIONS**

The following special provisions include miscellaneous notes for the project that are being highlighted to ensure inclusion in the bid responses. Several of these notes may be found in duplicate in the plan set or golf course specifications.

- If any discrepancies are found between the Owner front-end language and these Golf Course Specifications, then the Owner language shall prevail.
- Liquidated damages have not been included as part of these project documents, however grassing deadlines are important to allow adequate grow-in and timely re-opening. If grassing deadlines are deemed as unreasonable for any reason, bidders are asked to indicate such in a schedule provided with the bid submittal. If necessary due to weather or other unforeseen delays, overall project completion dates may be extended if it is in the best interest of the Owner to do so.
- Specific Project Dates.
  1. BID DUE DATE: See Owner front-end specs.
  2. STARTING DATE: September 20, 2021
  3. COMPLETION DATE: November 19, 2021 (\*8 weeks after start, with 1 rain week)



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## DIVISION 1

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### SECTION 01010 SUMMARY OF WORK

The Contractor shall provide all labor, materials, and equipment necessary to complete all work as set forth by the drawings and specifications.

#### 1.01 DESCRIPTION

- A. Summary of Work. Perform all work as shown and specified. The work is as follows, either wholly or in part.
1. Site Preparation
  2. Grading and Earthwork
  3. Drainage
  4. Feature Construction
  5. Site Restoration

#### 1.02 QUALITY ASSURANCE

- A. Requirements. The Contractor shall be solely responsible to ensure that all work is in compliance with all applicable local, state, and federal requirements regarding materials, methods of work, public safety, and disposal of excess and waste materials.
- B. Inspections, Permits, and Fees. The Contractor shall investigate and obtain necessary local permits and/or licenses to perform work within the local municipality, county and/or state district(s). The Owner shall assist, where possible, to obtain a waiver of any fees for permits which might be assessed. The Contractor shall meet all pertinent local codes.
- C. Materials and Methods. The Contractor shall be responsible to ensure that materials and methods of construction shall comply with the following standards.

American Society for Testing and Materials (ASTM)  
American Association of State Highway and Transportation Officials (AASHTO)  
National Fire Protection Association (NFPA)  
American Concrete Pipe Association (ACPA)  
National Electrical Code (NEC)  
National Sanitation Foundation (NSF)  
The Irrigation Association (IA)  
American Sod Producers Association (ASPA)  
American Standard for Nursery Stock (ASNC)  
Asphalt Institute (AI)  
National Crushed Stone Association (NCSA)  
American Concrete Institute (ACI)



- D. Installation of Manufactured Articles. Installation of all manufactured articles shall be in accordance with the recommendations of the manufacturer. Where necessary to the proper operation of the manufactured items, and in all cases where required by the Specifications, the manufacturers will furnish a factory trained service engineer to supervise the installation and start the operation of the article. Where factory supervision is a requirement for the furnishing of the required warranties, it will be provided whether stated in the Specifications or not.

### 1.03 SITE EXAMINATION

- A. Examination of Site. Bidders shall, with representative of Owner, visit site of proposed work and fully acquaint themselves with conditions as they exist, so that they may fully understand the facilities, difficulties, and restrictions attending the execution under the contract. Bidders shall also thoroughly examine and be familiar with the contract documents. The failure or omission of any bidder to receive or examine any form, instrument, or to visit the site (s) and acquaint himself with conditions there existing shall in no way relieve any bidder from any obligation with respect to his bid. By submitting a bid, the bidder agrees and warrants that they have examined the site(s) and contract documents, and where the contract documents require in any part of the work a given result to be produced, that the specifications and drawings are adequate and the required result can be produced under the specifications and drawings.

No plea of ignorance of conditions that exist or of conditions or difficulties that may be encountered in the execution of the work under this contract, as a result of failure to make the necessary investigations, will be accepted as an excuse for any failure or omission on the part of said contractor to fulfill in every detail all of the requirements of said contract, specifications, and plans, or will be accepted as basis for any claims whatsoever, for extra compensation. Upon application, all available information in the possession of the Architects will be shown to the bidders, but the correctness of any such information is not guaranteed.

### 1.04 PROJECT CONDITIONS

- A. Existing Conditions. Prior to and during the performance of the work, inspect and note surface and subsurface conditions on site and as presented by drawings and specifications, and notify Owner and/or the Golf Course Architect of conflicts or discrepancies prior to commencing or continuing site construction. Examine proposed construction areas and conditions of construction. Do not start or continue construction work until unsatisfactory conditions are corrected.
- B. Existing Utilities and Services. Underground and surface utility lines and services are indicated on the drawings according to best available information. Contractor shall locate and identify existing underground and overhead services and utilities within contract limit work areas, and provide adequate means of protection for utilities, services, and on-site improvements designated to remain. Wherever possible, perform construction work near utilities and services by hand, and shall repair utilities, services, and site improvements damaged during construction at Contractor's expense.

### 1.05 USE OF SITE

- A. Protection of Site Facilities. Protect existing building, paving, and other facilities on site and adjacent to site from damage caused by site construction work. Restore to original grade and



condition, those areas adjacent to site having been disturbed or damaged during site construction. Cost of repair and restoration of disturbed or damaged areas to be at Contractor's expense.

- B. Existing Trees and Vegetation.** All existing trees and vegetation scheduled to remain, shall be protected against injury or damage resulting from construction in a manner approved by the Owner and/or Golf Course Architect. This shall include protection from injury or damage caused by cutting, breaking, or skinning of roots, trunks, or branches. Also included is the smothering or compaction of root zones caused by stockpiling construction materials or excavated materials, vehicular traffic, and the contamination of plant material or root zones with harmful materials or chemicals.
1. Repair trees or vegetation damaged by construction operations in a manner acceptable to the Owner and/or Golf Course Architect. Repair trees or vegetation promptly to prevent continued deterioration caused by damages.
  2. Replace trees damaged beyond repair by construction operations, as determined by Owner and/or Golf Course Architect, with trees of similar size and species.
  3. Repair and replacement of trees damaged by construction operations due to lack of adequate protection during construction operations shall be at Contractor's expense.
- C. Excavation and Structure Protection.** Protect excavations or adjacent structures including utility service lines by shoring, bracing, sheeting, underpinning, or other methods, as required to prevent cave-ins or loose dirt from entering excavation. Barricade open excavations and post warning lights at work being performed adjacent to public streets or walks.
- D. Protection of Work.** Protect all work, whether in progress or complete, from adjacent work, pedestrians, or vehicular traffic. Provide temporary barricades and warning lights as required for protection of project work and public safety.

#### **1.06 SITE ACCESS**

- A. Occupancy of Premises.** The Owner shall retain the right to occupy the premises and adjacent facilities during the entire period of construction. Construction operations shall permit Owner's use of the premises and performance of normal operations where feasible.
- B. Project Scheduling.** When portions of the work are to be performed by separate prime contractors, the Owner shall provide project coordination and scheduling at a pre-construction meeting (and subsequent progress meetings) with representatives from each party.
- C. Separate Contractors.** When required by concurrent scheduling of construction by separate contractors, the site shall be equally accessible to all parties. Access shall not be restricted by any contractor except as deemed necessary due to scope of work and agreed upon by the Owner and/or Golf Course Architect in advance.
- D. Temporary Services.** Provide all temporary services as listed below:
1. Water - The Contractor shall obtain and pay for all permits or other sanctions required to furnish temporary water on the job site.



2. Light and Power - The Contractor shall install and pay for all such electrical materials as may be required for the temporary operation of equipment, temporary lighting purposes, and construction use during the entire construction period, and remove these items when no longer required. The Contractor shall pay for the cost of electric energy used by them and by all of their subcontractors including the cost of lamp replacements, meters, cables, panel boards, transformers, switches and all accessories and components required.
- E. Access Roads. Construction and use of access roads must be approved by the Owner. The Contractor will be liable for any damage to property other than the designated access roads and working areas. The designated access roads will be the responsibility of the Contractor in that they will repair the damage caused by trucks, tractors, etc. and by storage of materials.
- F. Work Area. The Contractor shall confine their apparatus, storage of materials, and operations of their personnel to the limits as indicated by the plans or as otherwise accepted by the Owner and/or Golf Course Architect, and shall not unreasonably encumber the premises with their material.
- G. Daily Cleanup. Prior to the completion of each work day, or as otherwise requested by the Owner preceding outings or large events, paved parking and entry areas (utilized by the Contractor) shall be swept of all dirt and debris and visible storage areas shall be organized and cleared of trash.
- H. Field Engineering. The Owner shall be responsible for the initial setting of benchmarks for vertical and horizontal control on the project site. Contractor to locate and protect survey control and reference points. Contractor shall be fully familiarized with the existing conditions and confirm survey control network prior to any work being performed.

**End of Section**





## SECTION 01300 SUBMITTALS

The Contractor shall provide all labor, materials, and equipment necessary to provide submittals to Owner and/or Golf Course Architect or as set forth by the drawings, specifications and contract documents. The costs, fees, or expenses necessary for submittals or testing as required by the contract documents shall be the responsibility of the Contractor.

### 1.01 PROJECT ADMINISTRATION

- A. Progress Schedule. Contractor shall submit, with bid, schedule(s) illustrating the projected timing and work flow for the project. Submit schedule(s) as a horizontal bar chart with separate lines for each major section of work or operation, identifying first work day of each week. Schedule(s) shall be revised and resubmitted with each Application for Payment, or as otherwise required or requested by the Owner, identifying changes since previous version and estimated percentage of completion for each item of Work.
- B. Application for Payment. The Contractor may make application for progress payments contingent upon all conditions of the Contract Documents. The contract form shall be provided and prepared by the Owner. Refer to associated conditions and bidding instructions for information regarding payment applications.

### 1.02 PRODUCTS

- A. Aggregates. All component materials required by the construction documents for the construction of greens and bunkers have been pre-determined by the Owner and Golf Course Architect and are listed in Section 01600. Contractor shall be required to ascertain current testing results, either as provided by the material supplier or by submitting samples to one of the certified testing labs listed below (at Contractor's expense), and shall provide those tests to the Owner for verification that they are current and meet the required analysis parameters, including the following:
  - 1. Green Expansion Rootzone: Particle size analysis, moisture content, permeability, penetrometer values, crusting, color, pH, shape
  - 2. Bunker Sand: Particle size analysis, moisture content, permeability, penetrometer values, crusting, color, pH, shape
  - 3. Drainage Gravel: Size distribution, permeability, lateral flow, porosity, angle of repose
  - 4. Bridging: Verify compatibility of drainage gravel and bunker sand to meet bridging requirements as set forth by bunker liner specifications (Better Billy Bunker).
  - 5. Certified labs:

Turf and Soil Diagnostics  
Attn: Sam Ferro  
613 East 1<sup>st</sup> Street  
Linwood, KS 66052  
855.769.4231



Tifton Physical Soil Testing Laboratory, Inc.  
Attn: Powell Gaines  
1412 Murray Avenue  
Tifton, GA 31794  
229.382.7292

Brookside Laboratories, Inc  
Attn: Jackie Backman  
200 White Mountain Drive  
New Bremen, OH 45860  
419.977.2766

- B. Soil Amendments. At the Owner's request and expense, submit representative soil samples from throughout the golf course site for soil testing. These samples shall be submitted in a timely fashion so as to allow for determination of soil amendments and fertilizer. Any amendment recommendations beyond those listed in the materials Section 01600 shall be addressed through change order procedures. The submittal, evaluation, or receipt of these samples shall not interfere with the timely completion of work in this contract.
- C. Seed Vendor's Certification. Submit seed vendor's certification for required grass seed mixtures, indicating percentage by weight and percentage of purity, germination, and weed seed for each seed specified.
- D. Sod Grower Certification. Submit sod grower's certification of grass species. Identify source location.
- E. Fertilizer Certification. Submit a certification of fertilizer(s) analysis.

### **1.03 DRAWINGS OF RECORD**

- A. Layout. Provide layout diagrams of all new green expansions and bunkers collected using a GPS system or equivalent, and submitted in both pdf and Autocad (v2018 or older) format.
- B. Drainage. Submit drainage system record drawings of all drainage components installed in greens, bunkers and fairways, collected using a GPS system or equivalent, and submitted in both pdf and Autocad (v2018 or older) format. Legibly mark drawings to document actual "as-built" construction of horizontal locations. Document field changes of dimension and detail; document changes made by change order. Document any existing daintile or structures which were encountered, altered or tied into during drainage installation.

**End of Section**



## SECTION 01400 QUALITY CONTROL

The Contractor shall provide all labor, materials and equipment necessary to complete all quality control requirements as set forth by the drawings, specifications, and contract documents. All work shall be subject to observation and final approval by the Golf Course Architect.

### 1.01 PERFORMANCE OF WORK

- A. Experienced Workmen. All work performed under this contract shall be completed by experienced workmen familiar with all procedures necessary to complete the work as specified by the contract documents. All work shall be performed under the supervision of a qualified supervisor.
- B. Products. Comply with all submittals as specified in Section 01300.

### 1.02 EXECUTION, TESTING, AND OBSERVATION

- A. Layout. All work limits, haul roads and staging areas shall be subject to review by the Owner and/or Golf Course Architect. Document any adjustments in the work limits or scope as requested by the Owner and/or Golf Course Architect. Verify impacts on the project quantities and/or budget, if any, and review with Owner and/or Golf Course Architect prior to incorporating changes.
- B. Earthwork. All grades and materials furnished for rough grading operations shall be subject to observation by the Golf Course Architect. After establishment of proper elevations, the Contractor shall furnish all assistance necessary to verify grades. No placement of topsoil, sand, or pea gravel will be permitted until after subgrades are observed and approved.
- C. Drainage. Prior to tie-in, test all existing drainage basins and pipes being used as outlets for new drainage to ensure their functionality. Any non-functioning outlets must be reported to Owner. Prior to final backfilling and grading, test all drainage work to ensure a free flowing sub-drainage system. Remove obstructions, replace damaged components, and retest system as required. All work shall be subject to random observation by the Golf Course Architect. The Contractor shall furnish all assistance necessary to observe work.
- D. Soil Preparation and Grassing. All finish grades, feature tie-ins and grassing preparations shall be subject to review by the Golf Course Architect. No seed or sod placement shall be permitted until final grassing lines have been determined and/or approved by the Golf Course Architect.

**End of Section**



## SECTION 01600 MATERIAL SPECIFICATIONS

The Contractor shall provide all labor, materials, and equipment necessary to submit, furnish, and install materials as required by the drawings, specifications, and contract documents.

### 1.01 DELIVERY AND STORAGE OF MATERIALS

- A. Deliver, store, and handle all materials on site to prevent damage and deterioration.
- B. The Owner will pay for materials stored on site, as long as proper waivers are submitted. The Owner will not pay for any materials stored off site.

### 1.02 EARTHWORK PRODUCTS

- A. Subgrade Fill Material used under green, fairway and bunker features shall be inert subsoil (preferably in situ) and free of sod, brush, roots, stones larger than four (4) inches in diameter, trash, and other perishables or debris from construction operations. If allowed by local regulations, these construction debris items may be placed in bury pits in out of play areas as approved and directed by the Owner.
- B. Backfill Material for Trenches (Solid Pipe), unless otherwise specified by drawings, shall be inert, in situ soil, free of clods or stones larger than 1" in diameter and containing no sod, brush, roots, trash or other perishable materials.
- C. Topsoil Material, whether in situ or imported, shall consist of a sandy loam silt, or loam with sufficient amounts of organic material to start and maintain plant growth as determined by the Golf Course Architect and/or Owner. Topsoil material shall be free of excess quantities of clay, hard lumps, roots, grass, stones, and other foreign materials.
- D. Existing Bunker Sand may be blended with topsoil as long as the mixture results in a sandy loam suitable for finish work, otherwise it shall be buried and used as fill material.

### 1.03 AGGREGATE PRODUCTS

- A. Testing and Substitutions. Provide current laboratory testing for all aggregates as required per Section 01300, Submittals. Any substitute materials or suppliers must be approved by the Owner and/or Golf Course Architect and submitted for proper testing and approval prior to bid date.
- B. Rootzone Mixture for Greens Expansion and Backfill Material for Perforated Green Drainage (2") shall be 6:3:1 Construction Mix as provided by Waupaca Sand and Solutions. Install in lifts and properly compact to ensure no trench settling.
- C. Drainage Gravel for Perforated Pipe (4" or larger) shall be clean, washed, crushed stone or pea gravel, 3/8" to 1/2" in size similar or equal to Bridging Gravel as provided by Waupaca Sand and Solutions.



- D. Drainage Gravel for Better Billy Bunker Liner shall be clean, washed, crushed stone or pea gravel, 3/8" to 1/2" in size similar or equal to Bridging Gravel as provided by Waupaca Sand and Solutions. Composition of this material shall be compatible with the specified bunker sand and/or greens rootzone mixture as it relates to USGA recommendations for bridging purposes.
- E. Sand for Bunkers shall be Fredonia Bunker Sand as provided by Waupaca Sand and Solutions.
- F. Rip Rap for Stabilization (Hole 7 Drainage) shall be Class 3 gradation, 4" – 6".

#### 1.04 DRAINAGE SYSTEM

- A. Drainage Piping (4" and above, perforated and solid) shall be corrugated, double-wall polyethylene pipe and fittings similar or equal to N-12 pipe manufactured and distributed by Advanced Drainage Systems, Inc. (ADS), Columbus, Ohio. Sizes as specified on drawings.
- B. Slit Drainage Piping (2", perforated) shall be corrugated, single-wall polyethylene micro-slit drain tile pipe and fittings similar or equal to TurfFlow by Hancor, distributed by Advanced Drainage Systems, Inc. (ADS), Columbus, Ohio.
- C. Manholes, Catch Basins, and Inspections Risers shall conform to details as shown on plans, or as otherwise approved by Owner and/or Golf Course Architect.

#### 1.05 SOIL AMENDMENTS AND FERTILIZER

- A. Soil Amendments. Testing of the golf course soil, per the request and expense of the Owner, will indicate what amendments, if any, will be required in addition to this contract. These revisions will be reflected in the bid schedule or through a change order to the contract documents. Materials shall be delivered and stored in a manner to prevent wetting and deterioration. Rate of application shall be as recommended by soil analysis and as approved by Owner and/or Golf Course Architect.
- B. Fertilizer. **OWNER SHALL SUPPLY ALL FERTILIZER MATERIALS.** Fertilizer shall be uniform in composition, free flowing, and suitable for application with approved equipment. Deliver fertilizer materials in original, unopened and undamaged containers showing weight, analysis, and name of manufacturer. Store in manner to prevent wetting and deterioration. Fertilizer which has been exposed to high humidity and moisture, or has become caked or otherwise damaged making it unsuitable for use, will not be accepted. All amendments above shall be worked into sand/soil after being applied and watered in to settle prior to grassing.

##### 1. FAIRWAYS/ROUGHS Pre-plant

- Hi-Cal Lime @ 1.5 Ton/acre
- Gypsum @ 500 lbs/acre
- Sulfate of Potash @ 200 lbs/acre
- Nutralene/Urea 70/30 mix @ 80 lbs/acre



## 1.06 GRASSING AND RESTORATION

- A. Sod shall be dense, well rooted, grown in mineral soil in the general locality where it is to be used and maintained at a height similar to the associated application (e.g. green, tee, fairway or rough heights). Sod shall be free of debris, weeds and other undesirable contaminants. Provide sod in rolls or panels convenient for handling with personnel or equipment available. Big roll sod will be acceptable, but must be approved by the Owner. Cut, deliver, and install all sod within a 24-hour period. Do not harvest or transport sod when moisture contact may adversely affect sod survival. Protect sod from sun, wind, and dehydration prior to installation. Do not tear, stretch, or drop sod during handling and installation.
1. Sod type for Greens: Borrowed bentgrass harvested from Owner's nursery.
  2. Sod type for Fairways: Borrowed bentgrass harvested from existing fairway locations.
  3. Sod type for Primary Roughs: Bluegrass sod as provided by Black Creek Sod Farm, Black Creek, WI, 920-984-3313.
- B. Seed and Blanket Seed shall be labeled in accordance with the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of invitation for bids. Deliver seed material in original unopened containers, showing weight, analysis, and name of manufacturer. Store in a manner to prevent wetting and deterioration. Seed which has become wet, moldy, or otherwise damaged in transit or in storage will not be accepted. All seed must be Certified Blue Tag sod quality and Oregon or Washington grown. The test date shown on the label must not exceed six (6) months prior to the seeding dates. Erosion Blanket shall be applied immediately following seeding per the manufacturer's installation instructions and recommendations. Deliver and store materials in a manner to protect from damage, weather and construction operations.
1. Seed type for Primary Roughs: HD Sports 2.0 Bluegrass Blend at 3 lbs per 1,000 sf
  2. Erosion Blanket for Primary Roughs: DS75 as manufactured by North American Green, or equal.
  3. Staples: Biodegradable stakes (4") by GreenStake.com, or equal
- C. Bunker Liner shall be Better Billy Bunker liner, installed at the depths and per the procedures provided by the manufacturer. Contact Todd Jenkins 615.812.2874

**End of Section**



## SECTION 01700 PROJECT CLOSE OUT

The Contractor shall provide all labor, materials, and equipment necessary to complete all project close out requirements as set forth by the drawings and specifications.

### 1.01 WARRANTIES

- A. Guarantees. Except as otherwise specified in the contract documents, the Contractor shall guarantee workmanship and materials associated with the fulfillment of this contract for a period of one (1) year from date of final acceptance from the Owner. The work shall be left in perfect order at completion and acceptance. Neither the final payment nor termination of the guarantee period, nor any provision in the contract document shall relieve the Contractor of the responsibility for negligence, faulty materials, or workmanship within the extent and period provided by law, and upon written notice they shall remedy any defects due thereto, and shall pay all expenses for damage to other work resulting therefrom. If specifications provide for methods of construction, installation, materials, etc. for which the Contractor cannot guarantee for the indicated period, it shall be the responsibility of the Contractor to inform the Owner in writing before submitting their bid. Otherwise, the Contractor shall be responsible to provide the method of construction, installation, materials, etc., which will be guaranteed for the indicated period of time.
1. Earthwork. All in place earthwork shall be free from heaving or settling due to use of unsatisfactory material, methods of construction, or inadequate compaction. Where earthwork repairs are deemed necessary, the Contractor shall remove the sod, fill and/or regrade, and relay the salvaged sod. Where sod is not salvageable, new sod shall be installed at the Contractor's expense. This no settlement clause shall extend over the entire period of the Contractor's guarantee of the job.
  2. Drainage. All in place drainage shall be free flowing and void of interruption from heaving, breaking or settling due to use of unsatisfactory material, methods of construction, or inadequate outlet. Where drainage repairs are deemed necessary, the Contractor shall remove the sod, install new drainage, replace and compact the backfill, and relay the salvaged sod. Where sod is not salvageable, new sod shall be installed at the Contractor's expense. This free flowing drainage clause shall extend over the entire period of the Contractor's guarantee of the job.
  3. Grassing. All in place grassing operations shall guarantee the quality and viability of the materials per Section 01600, Material Specifications, and the workmanship as specified in Section 02485, Grassing Specifications, but shall not include grow-in or extended maintenance. This guarantee shall extend until each grassed area has been accepted by the Owner in writing. See Maintenance (1.02) for requirements prior to acceptance.

### 1.02 MAINTENANCE AND FINAL REVIEW

- A. Maintain all completed work, installed materials, and other portions of the contract until completion and Owner's acceptance, in writing, of each stage of construction. This includes maintenance and re-establishment against the effects of erosion, wind, vandalism or acts of God.



- B. Field review to determine acceptance of completed construction shall be made by the Golf Course Architect and/or Owner and be subject to compliance with the contract documents.

### **1.03 PROJECT CLEAN-UP**

- A. Clean-up. Perform project cleaning during construction and upon completion of construction. Remove from site all excess material, trash, debris, and equipment, repair any damage resulting from construction operations, and complete all clean-up operations prior to final acceptance by the Golf Course Architect and Owner.
- B. Waste Material Disposal. Stockpile, haul from site, and legally dispose of waste materials; including excess excavated materials, rock, trash, and debris. If permitted by Owner, waste materials may be transported to a designated disposal area on-site.
- C. Disposal Routes. Maintain disposal routes clear, clean, and free of debris.
- D. Burning of Material. On-site burning is not permitted, dispose of material off-site or in Owner designated areas.

**End of Section**





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## DIVISION TWO

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### SECTION 02100 SITE PREPARATION

The Contractor shall provide all labor, materials, and equipment necessary to complete all Site Preparation as set forth by the drawings and specifications.

#### 1.01 GENERAL

A. Site Preparation Work. Perform site preparation work as shown and specified. The work includes:

1. Protection of existing underground and overhead services and utilities.
2. Protection of existing trees to remain.
3. Installation of erosion control measures.
4. Stripping turf areas and removing existing sand.
5. Stripping and stockpiling topsoil.
6. Removing designated site improvements.
7. Removing designated vegetation.

A. Quality Assurance. Comply with Specifications Section 01010 and 01400.

B. Materials and Equipment. Comply with Specifications Section 01600.

#### 1.02 CLEARING

A. Trees or Improvements to Remain. Locate and identify trees and site improvements indicated to remain by drawings or specifications. Refer to 01010 Summary of Work, Section 1.05 for information on tree protection.

B. Clearing and Stump Removal. Owner shall clear and grub all trees and brush indicated on the plans for removal, including grinding of all stumps to minimum 2' depth and disposal of debris. Contractor shall remove and dispose of roots (extending beyond stump excavations) as needed to properly grade and prepare soil for restoration.

#### 1.03 STRIPPING TURF, SAND AND TOPSOIL

A. Stripping Turf Areas. Roto-till turf in designated areas utilizing a minimum of two passes or as otherwise necessary to sufficiently eradicate and pulverize.

B. Sand from Bunkers. Existing sand may be blended with topsoil as long as the mixture results in a sandy loam suitable for finish work, otherwise excess sand shall be buried within the work limits and used to generate fill material.

C. Stripped Sod for Reuse. Existing sod designated for re-use shall not be stripped until new areas are prepped and ready for sod laying. If sod is stripped prior to being ready for immediate placement,



then it is the Contractor's responsibility for storing and keeping alive until it can be properly placed in the new location.

- D. Stripping Topsoil. Strip topsoil to minimum six (6) inches in depth in all areas to be regraded, resurfaced, paved, or disturbed within work areas and as provided for in drawings.
- E. Topsoil Stockpile. Stockpile topsoil in a location acceptable to the Owner and the Golf Course Architect until ready for replacement during finish grading and preparation of roughs, fairways, or planting beds. Stockpiled topsoil shall be free from trash, brush, stones over three (3) inches diameter, and other foreign matter. Grade and slope stockpiles to maintain drainage and to prevent erosion. No topsoil shall be removed from the site without written approval of Owner or the Golf Course Architect. All stockpile areas located outside of the construction limits must be approved by the Owner and/or Golf Course Architect and shall be restored to original conditions.

#### **1.04 SITE IMPROVEMENTS**

- A. Existing Utilities or Services. Perform work and provide necessary materials to protect, disconnect or relocate existing utilities or services as indicated. Submit to Owner a record of existing termination points before disconnecting.
- B. Sidewalk, Cartpath, or Curb Removal. Remove existing sidewalks, paving, cartpaths, or curbing including base material, if present, as required to permit forming and installation of new work as shown by drawings. Cut existing sidewalks or paving in neat, straight lines at existing expansion or control joints to provide uniform, even transition from new to adjacent existing work. All removed material shall be disposed of off-site unless otherwise approved by Owner and/or Golf Course Architect.
- C. Drainage Structures. Revise existing catch basins, draintile, or inlet manhole structures to complete work as specified by construction documents.

#### **1.05 FINAL CLEAN UP AND DISPOSAL OF WASTE MATERIALS** Comply with Specifications Section 01700.

**End of Section**



## SECTION 02200 EARTHWORK

The Contractor shall provide all labor, materials, and equipment necessary to complete all Earthwork as required by the drawings and specifications.

### 1.01 GENERAL

- A. Earthwork. Perform earthwork as shown and specified. The work includes:
1. Layout of work to be performed.
  2. Site grading and filling to elevations, profiles, and contours as shown by working drawings.
  3. Subgrade and granular base preparation for structure slabs, walks, and paving.
  4. Excavating for pond construction, including clay lining(s).
  5. Topsoil placement and finish grading.
  6. Provide and place stone rip-rap.
  7. Feature construction including greens and bunkers.
- B. Quality Assurance. Comply with Specifications Section 01010 and 01400.
- C. Materials and Equipment. Comply with Specifications Section 01600.
- D. Warranties. Comply with Specifications Section 01700.

### 1.02 PREPARATION

- A. Layout of Work. Prior to any grading operations, all excavation and fill areas shall be staked in the field showing slope stakes, boundary stakes, cut stakes, fill stakes, etc. as required to layout and control the work. Layout shall be subject to review by the Golf Course Architect to check for any abnormalities or needed adjustments to maximize earth moving efficiency.
- B. Required Inspection, Tests, Approvals, and Location Recordings. Comply with Specifications Section 01400.
- C. Existing Utilities and Services. Comply with Specifications Section 01010.

### 1.03 SITE GRADING

- A. Grading Requirements. Perform grading within contract limits, including adjacent transition areas, to new elevations, levels, profiles, and contours as shown by construction drawings. Provide subgrade surfaces parallel to finish surface grades. Provide uniform levels and slopes between new graded elevations and existing grades. Provide subgrade surface free from irregular surface changes and as follows:
1. Rough grading: Plus or minus 0.10 feet subgrade tolerance. Required surface finish will be that ordinarily obtained from a blade-grader.



2. Provide subgrade surface free of exposed boulders or stones exceeding 4" in greatest dimension in paved areas and 2" in turf and planting areas.
  3. Paved areas: Shape surface of subgrade areas to alignment, grade, and cross-section indicated by working drawings. Compact subgrade, as required, to receive paving base materials. Subgrade tolerance plus or minus .10 feet.
  4. Granular Base: Grade subgrade surface smooth and even, free of voids to the required subgrade elevation. Provide compacted subgrade suitable to receive granular base materials. Tolerance 1/2" in 10'-0".
- B. Drainage. Grade surface to provide drainage away from site structures and golf course features, and to prevent ponding and pockets in surface drainage. Provide necessary pumps and drainage lines to maintain excavated area free of water, ice, and snow during construction operations.

#### 1.04 EXCAVATING

- A. Excavation. All on-site excavation of materials encountered within the project area shall be performed to the subgrade lines and grades shown on the drawings. Proposed lines and grades shown on the drawings are to finish grade. The Contractor shall refer to the drawings and specifications for necessary information to calculate subgrade elevations throughout the site. The Owner reserves the right to review all excavated material for quality and declare first refusal of sub-standard soil in critical fill areas.
- B. Over-Excavating. In the event that excavations are made below the subgrade elevations, the Contractor shall replace the excavated material in horizontal lifts not to exceed eight (8) inches (loose measurement) as specified for embankments. Placed material shall be compacted to a degree consistent with surrounding undisturbed material.
- C. Extra Excavation. Excavate unsatisfactory soil materials extending below required elevations to depth as shown by working drawings. Replace with suitable backfill material per Specifications Section 01600 in horizontal lifts not to exceed eight (8) inches (loose measurement). Placed material shall be compacted to a degree consistent with surrounding undisturbed material.
- D. Excavation of Golf Course Features. Excavate greens and bunkers to elevations and dimension shown on working drawings.
- E. Excavation for Walks and Cartpaths. Excavate for curbs, walks, cartpaths, and paving to elevations and grades indicated on working drawings. If required by drawings and specifications, excavate to provide for placement of base material.

#### 1.05 EMBANKMENT

- A. Subgrade Embankments. Subgrade embankments shall be constructed, after plowing or scarifying the natural ground surface to a depth of 6", by depositing and compacting suitable backfill material per Specifications Section 01600. Construction to be in accordance with subgrade lines and grades on the drawings.
- B. Fill Material. All fill materials shall comply with Specifications Section 01600. All fills, especially those under fairway, bunker or green features, must be built from suitable soils and using methods



that minimize settling and allow for proper finish work. Any methods such as material segregation, drying and/or dewatering deemed necessary to ensure soil stability and workability are the responsibility of the Contractor, who will ultimately be responsible for working the soil to a finish grade and fixing any settling areas that occur during post construction warranty period. The Owner reserves the right to review all excavated material for quality and declare first refusal of sub-standard soil in critical fill areas.

1. Fill shall be loosely placed in horizontal lifts so that the successive lifts shall blend together. The maximum thickness per lift of compacted fill shall not exceed 8". Each layer of fill shall be compacted evenly and densely by distributing the movement of the construction equipment uniformly over the entire embankment area. The material in each layer shall have the proper moisture content to obtain compaction. When too dry, water shall be added; when too wet, the material shall be aerated. Materials placed by dumping in piles or windrows shall be spread uniformly to not more than 8" thickness before being compacted.
  2. Suspend fill operations when satisfactory results cannot be obtained because of environmental or other unsatisfactory site conditions. Do not use muddy or frozen fill materials. Do not place fill material on muddy or frozen subgrade surface. Maintain adequate drainage of rainwater and prevent ponding of surface water in pockets. When fill placement is interrupted by rain, remove wet surface materials or permit materials to dry before placement.
- C. Soil Stabilization. When exposed subgrade surfaces become spongy during construction operations and soil stabilization is required, stabilize subgrade materials as directed by a Soil Engineer. Soil stabilization will be paid for as a change in work. Obtain Owner and/or Golf Course Architect's written authorization before performing soil stabilization work.
- D. Settlement Areas. Fill and compact all areas of settlement to proper grade before subsequent construction operations are performed.
- E. Backfilling. Place backfill materials in uniform layers no greater than 8" loose thickness over entire backfill area. Use hand tamping or vibrating compactors at foundation walls, retaining walls, and similar locations. Do not use large rolling equipment adjacent to foundation walls and retaining walls. Do not backfill against foundation walls or retaining walls until walls for bearing surface have reached design strength or are properly braced, and backfilling operations approved by Owner or Architect. Provide suitable backfill materials compliant with Specifications Section 01600.
- F. Granular Base. Provide minimum 4-inch depth of granular base under structure concrete slab-on-grade and asphalt paths. Granular base material per Specifications Section 01600.

#### 1.06 FINISH GRADING

- A. Topsoil Replacement. Uniformly distribute and spread stockpiled topsoil to a minimum compacted depth of 6". Use loose, dry topsoil. Do not use frozen or muddy topsoil. Place during dry weather.
1. No spreading of topsoil will be permitted until subgrade is approved by Golf Course Architect.
  2. Fine grade topsoil to eliminate rough and low areas ensuring positive drainage. Maintain levels, profiles, and contours of subgrade as shown or specified on working drawings.



3. Remove stones, roots, weeds, and debris while spreading topsoil materials. Rake surface clean of stones 2 inches or larger in any dimension and all other debris. Provide surface suitable for soil preparation as specified for seeding and sodding work.
  4. Soil compacted by construction equipment or soil on compacted slopes or grades shall be scarified to a minimum depth of 2 inches before applying topsoil to blend the topsoil in, eliminate a layering effect, and reduce erosion and sloughing away.
- B. Greens. All putting surface expansions shall be graded to conform to the lines, grades, and cross sections as shown on the drawings and shall be subject to review by the Golf Course Architect. Finish surfaces shall be compacted to the degree necessary to prevent future settling. A uniform layer of 6" suitable topsoil shall be placed on all banks. Unless otherwise required by the construction documents, the upper layer(s) of putting surface shall consist of a mixture of materials as specified in Specifications Section 01600 and as depicted by the drawings.
- C. Bunkers. All bunkers shall be graded to conform to the lines, grades, and cross sections as shown on the drawings and shall be subject to review by the Golf Course Architect. Finish surfaces shall be compacted to the degree necessary to prevent future settling. A minimum depth of 6" of suitable topsoil shall be placed over the subgrade around the entire bunker, after approval of the subgrade by the Golf Course Architect. Sand bunkers are to be vertically edged to a depth of 6" along their inside margin prior to final cleaning, unless otherwise depicted by the drawings. Bunker bottoms shall be excavated properly to account for bunker liner depths, cleaned by hand raking, and rolled firm and smooth preceding placement of draitile, liner and sand. Sand shall be installed to a 4" compacted depth along all bunker edges and flashed faces and 6" compacted depth along bunker bottoms, unless otherwise depicted by the drawings.
- 1.07 FIELD QUALITY CONTROL** Comply with Specifications Section 01400.
- 1.08 FINAL CLEAN UP AND DISPOSAL OF WASTE MATERIALS** Comply with Specifications Section 01700.

**End of Section**



## **SECTION 02400 DRAINAGE**

The Contractor shall provide all labor, materials, and equipment necessary to furnish and install all the drainage systems as required by the drawings and specifications.

### **1.01 GENERAL**

- A. Drainage. Provide site drainage as shown and specified. The work includes:
  - 1. Site drainage structures and piping.
  - 2. Subdrainage systems.
  - 3. Excavating and backfilling drainage work.
- B. Quality Assurance. Comply with Specifications Section 01010 and 01400..
- C. Materials and Equipment. Comply with Specifications Section 01600.
- D. Warranties. Comply with Specifications Section 01700.
- E. Earthwork Operations. Coordinate installation of the site drainage system with excavating and backfilling work performed under Specifications Section 02200, Earthwork.

### **1.02 PREPARATION AND INSPECTIONS**

- A. Project Layout. Layout drainage work and establish extent of excavation by area and elevation. Designate and identify datum elevation and project engineering reference points. Set required lines, levels, and elevations. Review all outlet locations to ensure adequate depths for proper tie-in.
- B. Site Examination. Comply with Specifications Section 01010.
- C. Existing Utilities. Comply with Specifications Section 01010.
- D. Inspections and Testing. Comply with Specifications Section 01400.
- E. Infiltration. It shall be the intention of these specifications to secure a subdrainage system with a minimum amount of infiltration. The joints shall be tight, and visible leakage in the joints shall be repaired at the Contractors expense by any means found to be necessary.

### **1.03 GENERAL INSTALLATION (4" PIPE AND LARGER)**

- A. Trenching and Excavation. No trenching will be allowed more than 300 feet in advance of pipe laying. All trenches shall be completed and backfilled each day. Provide trench wall support, bracing and pumping of surface or ground water as required to provide suitable conditions for performing the work. The width of the trench at the top of the pipe shall be sufficient to permit thorough tamping of the backfill under the haunches and around the pipe, but shall not exceed external diameter of the pipe by 8" on either side.



- B. Unsuitable Soil. Where a firm foundation is not encountered at required grade, due to soft, spongy, or unsuitable soil, all such unsuitable soil under the pipe and for the width of the trench shall be removed below grade and replace with a cushion of well compacted granular backfill having a thickness under the pipe of not less than 4".
- C. Trenching across Existing Turf. When new drainage pipe runs across existing turf, the sod shall be stripped and replaced with the same sod once the pipe is installed and backfilled. If existing sod is not salvageable it shall be replaced with new sod. Contractor shall notify Owner and/or Golf Course Architect of marginal turf quality prior to stripping.
- D. Location. Draintile shall be located true to line and grade in the places specified by the drawings. Where deviations exist between the plan and field locations, such deviations must be brought to the attention of the Owner and/or Golf Course Architect. Draintile shall be installed in features in accordance with plan details, or as otherwise approved by the Golf Course Architect.
- E. Staging and Delivery. All site drainage pipe, manholes, and appurtenances shall be laid true to line and grade in trenches and tunnels as specified. All pipe shall be staged as close to the ditch line as safety and operations permit. Pipe shall not be thrown or dropped from vehicles or equipment beds, all pipe must be lowered into the trench with suitable apparatus for the purpose. Damaged material shall be replaced at Contractor's expense.
- F. Laying Solid Drainage Pipe. All pipe laying shall commence at the lower end of the line and proceed upgrade. Bell and spigot pattern pipe shall be laid with the bell end upgrade. Tongue and groove type pipe shall be placed with the groove end upgrade. Pipe shall be fitted, matched, and jointed to form a continuous sewer or drain with a smooth uniform invert. As each length of pipe is placed, the mouth of the pipe shall be protected to prevent the entrance of earth or bedding material. Do not place pipe in water, or place pipe when trench or weather is unsuitable for site drainage work. Install pipe joint gaskets in accordance with manufacturer's recommendations. Cut pipe ends entering structures flush with inner face of structures and secure with hydraulic cement or foam, unless otherwise specified by the plans. Obtain required inspections and perform testing prior to backfilling. Remove obstructions, replace damaged components, and retest as required. Provide a satisfactory free flowing site drainage system.
- G. Laying Perforated Draintile. Perforated tile drains shall be laid on a firm, undisturbed layer of bedding material (as indicated by plans and Specifications Section 01600) to reduce possible wash of subgrade soil up into tile line by fast water flow. If over-digging occurs, all loosened dirt must be removed and the trench bottom returned to grade with suitable backfill material. Lay draintile with joints closed, and firmly bedded in drainage fill material. Provide full bearing for each pipe section. Provide continuous slope in the direction of flow with minimum fall equal to 0.5%. Provide collars and couplings for all in-line joints and ell, elbow, or bend section for all corners and changes in direction. Provide imperforated run out pipe and extend to out fall connection or daylight as specified by drawings.
- H. Connections. The junction of two or more draintiles shall be made in strict conformance with the contract drawings and in accordance with manufacturer's recommendations. The cost of all connections shall be included in the contract price for new pipe unless otherwise specifically provided for in the contract. Prior to tie-in, test all existing drainage basins and pipes being used as





outlets for new drainage to ensure their functionality. Any non-functioning outlets must be reported to Owner.

- I. Drainage Structure Construction. Construct catch basins, manholes, inspection risers and other drainage structures as shown on drawings.
- J. Backfilling. Backfill trenches with suitable backfill materials compliant with Section 01600, Material Specifications. For solid pipe, backfill trenches in 8" compacted layers to subgrade surface, ensuring a cover of not less than 18" over piping, unless otherwise indicated by the plans. Backfill evenly on both sides of piping for its full depth. Provide thorough compaction of fill under pipe haunches. All perforated tile drains, when placed, shall have the space between the pipe and the bottom and sides of the trench backfilled with aggregate material per Specifications Section 01600. Thoroughly tamp with a shovel, hoe, or light tamper as placed to a minimum of 2" over top of tile, or as otherwise specified by drawings.
- K. Restoration of Surfaces. Any settlement of the backfill below the original ground surface shall be remedied by the Contractor per Specifications Section 01700. Replace paving, turf and finishing surfaces disturbed to accommodate the subdrainage system as specified in applicable sections of these specifications, except where new surfaces are provided as part of the work.

#### **1.04 SLIT DRAINAGE INSTALLATION (2")**

- A. Greens. On greens expansions, all work as listed shall be completed in totality prior to placement of top mix. For existing greens being resurfaced, all work shall be completed prior to related re-grassing process. Otherwise, the process of installing subsurface slit drainage in greens shall be as follows:
  - 1. Laser survey each green site to determine surface drainage patterns and outlet points.
  - 2. Layout drainage system on a 6' spacing ensuring minimum 1% positive grade on all mainlines and laterals. Confirm drainage layout with Owner and/or Golf Course Architect prior to starting installation.
  - 3. Trench a minimum of 14" deep (below finish surface grade) and 3"-4" wide with laser grade control. Trencher shall be rubber tired or rubber tracked and operated on plywood. Contain all excavated trench spoils on plywood (or equivalent), not allowing to touch green surface. Hand shovel all excavated material into small trailers for use or disposal on site, as directed by Owner and/or Golf Course Architect.
  - 4. Install 2" drain tile including all connections, flushouts and observation risers. Backfill in lifts with specified sand mix and compact to ensure no trench settling (see Specifications Section 01600 for all materials).
  - 5. Replace sod to exact locations where removed, leaving no gaps. Complete initial watering following install. Greens to be in playable golf condition upon completion.

#### **1.05 CLEAN UP AND DISPOSAL OF WASTE MATERIALS** Comply with Specifications Section 01700.

**End of Section**



## SECTION 02485

### GRASSING

The Contractor shall provide all labor, materials, and equipment necessary to furnish and install all grass as required by the drawings and specifications.

#### 1.01 GENERAL

A. Grassing. Provide seeded and (or) sodded turf areas as shown and specified. The work includes:

1. Soil preparation
2. Seed and (or) sod fairways, rough, greens and other indicated areas
3. Mulch and blanket
4. Reconditioning existing turf areas

B. Quality Assurance. Comply with Specifications Section 01010 and 01400.

C. Submittals. Comply with Specifications Section 01300.

D. Materials and Equipment. Comply with Specifications Section 01600.

E. Warranties. Comply with Specifications Section 01700.

#### 1.02 PREPARATION

A. Timing. Perform seed and (or) sodding work only after tree planting and all other work affecting ground surface has been completed.

B. Irrigation System. The irrigation system will be installed prior to grassing operations (by Owner). Locate, protect, and maintain the irrigation system during grassing operations. Repair irrigation system components damaged during grassing operations at Contractor's expense.

C. Layout and Preparation. All final feature layout shall be completed and/or approved by the Golf Course Architect prior to commencement of planting operations. Limit preparation to area which will be immediately grassed.

D. Topsoil. Loosen topsoil to minimum depth of 4". Remove stones over 1" in any dimension and sticks, roots, rubbish, and extraneous matter. Dispose of all collected material in a manner approved by the Owner and/or Golf Course Architect.

A. Fine Grade. Grade area to a smooth, free draining, even surface with a loose, moderately coarse texture. Roll and rake, remove ridges, and fill depressions as required to drain.

B. Basic Soil Amendments. Incorporate amendments, if needed per testing results (see Specifications Section 01300), into the soil as a part of the soil preparation process prior to seedbed preparation, fertilizing, and planting. Each amendment material shall be broadcast or spread evenly at the



specified rate over the planting area. Then, all amendments are to be thoroughly incorporated at the same time into the top 3"-4" of soil until they are a pulverized and a homogenous layer of topsoil ready for planting. Incorporation and mixing shall be accomplished with roto-tiller or disc-harrow machinery.

- C. Starter Fertilizer. Apply starter fertilizer, as required, within two days prior to grassing, thoroughly and evenly incorporating into the top 1". Lightly rake until the finished grade is smooth, loose, and pulverized.
- D. Soil Preparation. Following applications of fertilizer, compact planting area by making two passes with a culti-packer, or approved similar equipment, weighing at least 90 pounds per linear ft of roller. Make the second pass with a culti-packer at right angles to the first pass. Following compaction, clear the surface of any remaining rock (1" or larger), roots, sticks or debris that might interfere with maintaining turf at anticipated playing heights of cut. Clean-up work area at any stage of construction as long as the final end result is produced.

### 1.03 INSTALLATION

- A. Sodding. Immediately prior to, but not in excess of 24 hours before placing the sod, work the soil surface until it is in a satisfactory condition per preparation requirements. Rework any prepared surfaces that become crusted to an acceptable condition for sodding. No sod shall be laid until final outlines have been approved by the Golf Course Architect.
  - 1. When the surface is dry enough to walk on, place the sod on the prepared surface with the edges in close contact and alternate courses staggered at least 12". On all slopes exceeding 5:1, the sod shall be secured with pegs. Plug any openings that may occur with sod, then thoroughly roll and water. Continue watering and general maintenance until work is accepted by the Owner and/or Golf Course Architect in writing, see Specifications Section 01700.
  - 2. Place sod only when the ground is in a workable condition, preferably in temperatures < 90-degrees F. Sod may only be laid in temperatures > 90-degrees F provided that irrigation is in working order and Owner is notified and approves of such. Sod shall not be placed when the sod or ground surface is frozen or during an extended drought.
  - 3. Protect all areas designated to be sodded against damage from the time work is started until the date of acceptance by the Owner, in writing. Move heavy equipment or materials over lawn areas on planks, and only if necessary. Repair any damage by heavy equipment or other movement over the planted area by preparing, grading, levelling and replanting.
- B. Seeding. Seed immediately after preparation of bed. Optimal seeding period is between August 1 and September 1, or at such other times acceptable to the Owner and/or Golf Course Architect. Perform seeding operations when the soil is dry and when winds do not exceed 10 miles per hour. Sow grass seed at the rate specified in Specifications Section 01600, and apply as follows:
  - 1. Fairways and Roughs - In exposed soil areas, apply seed with a Brillion seeder or approved similar equipment. Install seed evenly by sowing equal half quantities in two directions, at 90-degree (or 45-degree) angles to each other. In existing areas where turf or thatch layer



remains, apply seed with slit seeder implement sowing equal half quantities in two directions at 90-degree (or 45-degree) angles to each other.

2. Protect all seeded areas against damage from the time work is started until the date of acceptance by the Owner, in writing. Avoid moving heavy equipment or materials over planted areas. Repair any damage by preparing, grading, levelling and replanting.
- C. Erosion Blanket. On the same day and immediately following planting operations, cover all indicated slopes/areas with erosion blanket materials as determined in Specifications Section 01600. On slopes, start blanket three feet over crest and roll downhill keeping the edge butted against adjacent blanket. Do not stretch. Use 4 staples at the start of each roll. When the blankets are placed along side each other, staple so as to catch the edge of each roll. In addition to stapling the edges of the blanket at 12" intervals, place staples in the center of the blanket halfway between the outer staples.

#### **1.04 RECONDITIONING EXISTING LAWNS**

- A. Damaged Turf Areas. Recondition existing turf areas damaged by construction operations, storage of materials or movement of equipment, per the following methods or as otherwise accepted by the Owner and/or Golf Course Architect:
  1. Cultivate bare and compacted areas thoroughly and provide topsoil as needed to fill low areas and meet new finish grades.
  2. Remove diseased or unsatisfactory turf areas, do not bury under soil.
  3. Remove topsoil containing foreign materials resulting from construction operations, including oil drippings, stone, gravel, and other construction materials.
  4. Rake, aerate (if compacted), cultivate soil, fertilize and seed where substantial, but thin turf remains.
  5. Provide fertilizer, seed and/or sod as specified and as required to provide a satisfactory reconditioned turf where bare soil exists.
  6. Water and maintain newly restored areas until accepted in writing by Owner.

**1.05 GUARANTEE AND ACCEPTANCE** Comply with Specifications Section 01700.

**1.06 FINAL CLEAN UP AND DISPOSAL OF WASTE MATERIALS** Comply with Specifications Section 01700.

**End of Section**